REMARKS

The Office Action mailed October 31, 2002 has been reviewed and the comments of the Examiner have been carefully considered. Claims 1, 3 and 6 have been amended. Claims 2, 4 and 8 have been canceled without prejudice or disclaimer. Thus, claims 1, 3, 5-7 and 9-11 remain pending and submitted for reconsideration.

The specification has been amended as requested by the Examiner. Withdrawal of the objection is respectfully requested.

Claims 2, 3, 4, 5, 8 and 9 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,419,176 (Mizuno) in view of U.S. Patent Application Publication No. 2002/0000487 (Hamaue). The rejection should be withdrawn because Hamaue is not prior art to the present application.

The filing date of Hamaue is April 18, 2001. The present application is entitled to the benefit of the filing date of its priority application (i.e., November 17, 2000). As noted in the Office Action, a certified copy of the priority application has been received by the PTO. A certified English translation of the priority application is enclosed. Thus, the requirements of 37 C.F.R. § 1.55 have been meet and the rejection should be withdrawn.

Claims 1, 3 and 6 have been amended to include the limitations of canceled claims 2, 4 and 8, respectively. Thus, claims 1, 3 and 6 are now in condition for allowance. Claims 4, 5, 7 and 9-11 each depend from one of these allowable independent claims and are, therefore, likewise in condition for allowance.

In view of the foregoing amendments and remarks, applicants respectfully submit that the pending claims are now in condition for allowance. An early notice to this effect is earnestly solicited. If there are any questions regarding the application, or if an examiner's amendment would facilitate the allowance of one or more of the claims, the examiner is invited to contact the undersigned attorney at the local telephone number below.

Respectfully submitted,

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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge deposit account No. 19-0741 for any such fees; and applicants hereby petition for any needed extension of time.

VERSION SHOWING CHANGES MADE

In the Specification:

[029] The operation of the pretensioner 100 will now be described. Before the actuation of the pretensioner 100, the ring gear 118 is held by the pins 117. In this state, the ring gear 118 and the pinion 120 are out of mesh. Therefore, the spool 102 can freely rotate. When the gas generator 112 is ignited to generate gas, the balls 115 are pushed via the piston 114 by the pressure of gas. As a result, the pins 117 are sheared by forces from the balls 115, whereby the ring gear 118 is released to be free and the internal teeth [1 18b] 118b of the ring gear 118 and the external teeth 120a of the pinion 120 are meshed with each other as shown in Fig. 8 and Fig. 9. As the ring gear 118 is forced to be rotated by the balls 115, the spool 102 is rotated via the pinion 120 coupled with the ring gear 118. In this manner, the seat belt is pretensioned.

[045] As shown in Fig. 3, a spool bearing 30 is interposed between the spool 102 and the hole 110a of the pretensioner plate 110. The surface of the spool bearing 30 is applied with lubrication coating. Employed as this coating material may be Solvest "dry coat"® in the same manner as mentioned above. Because of the spool bearing 30, the spool [2] 102 is prevented from being directly subjected to the load.

In the Claims:

1. (Amended) A pretensioner which rotates a spool of a seat belt retractor in a belt winding direction to pretension a seat belt in the event of an emergency, comprising:

a gas generator;

a plurality of serial balls which will be accelerated by the gas from the gas generator;

a path for guiding the balls; and

a rotational member having a plurality of driving points wherein said balls collide with said driving points so as to apply rotational torque to said rotatable member;

wherein the driving points of said rotational member are partially positioned within said path, and

wherein a space for passage of said balls is defined by said path and said driving points and is narrower than the diameter of said balls; and

wherein the surfaces of said balls are applied with lubrication coating.

3. (Amended) A pretensioner which rotates a spool of a seat belt retractor to pretension a seat belt in the event of an emergency, comprising:

a gas generator;

a curved pipe connected to the gas generator and positioned to receive generated gas;

a plurality of balls which are arranged in series in the pipe to be accelerated by the generated gas in a direction away from the gas generator; and

a gear surrounded by the pipe and configured to rotate to drive rotation of the spool, the gear having external teeth for receiving at least one of the plurality of balls;

wherein the pipe includes an opening configured to permit the balls to contact the gear;

wherein the pretensioner is configured so that a wall of the pipe opposite the opening is elastically deformed by at least one of the balls during rotation of the gear; and

wherein an interior surface of the pipe is coated with lubricant.

6. (Amended) A pretensioner which rotates a spool of a seat belt retractor in a belt winding direction to pretension a seat belt, comprising::

a plurality of balls positioned in a pipe connected to a gas generator;

a rotatable gear having external teeth;

wherein the pretensioner is configured so that when generated gas enters the pipe the balls are accelerated through a space between the rotating gear and a portion of the pipe containing an opening;

wherein the space is configured so that as the balls move through the space the balls contact the external teeth of the gear to rotate the gear; and

wherein a width of the space is less than the diameter of at least one of the balls, thereby requiring a portion of the pretensioner to deform in order to allow the balls to pass through the space; and

wherein the inner surface of the pipe is coated with lubricant.